

ORIGINAL ARTICLE

Development of the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Japan to recognise positive feelings about caregiving for people with dementia

Taiga FUJU ^{1,2} Tetsuya YAMAGAMI,² Haruyasu YAMAGUCHI¹ and Tsuneo YAMAZAKI²

¹Tokyo Centre for Dementia Care Research and Practices and ²Gunma University Graduate School of Health Sciences, Tokyo, Japan

Correspondence: Dr. Taiga Fujii, Tokyo Centre for Dementia Care Research and Practices, 1-12-1 Takaido-Nishi, Suginami-Ku Tokyo 168-0071, Japan. Email: m15711048@gunma-u.ac.jp

Disclosure: The authors have no potential conflicts of interest to disclose.

AMED JP19dk0207033

JSPS KAKENHI JP18K12990

Received 24 August 2020; revision received 28 April 2021; accepted 12 May 2021.

Key words: DCPFS-21, dementia, family caregiver, positive aspects of caregiving, positive psychology, scale.

Abstract

Background: This study aimed to develop and validate the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Japan.

Methods: We selected and generated 27 items based on the preliminary 25-item version of the DCPFS. Next, the DCPFS-21 was developed and validated through two phases. In Phase 1, we obtained data from 147 caregivers of people with dementia by using the 27-item version, examined the construct validity and internal consistency of the scale and then selected 21 items (DCPFS-21). In Phase 2, we compared the scores of 30 caregivers of people with dementia on the DCPFS-21 with the standard scales. Four weeks after the first examination, we re-examined the intra-rater reliability.

Results: In Phase 1, via factor analysis, we reduced the 27 items to 21 items (DCPFS-21). Moreover, the DCPFS-21 was grouped into four subscales, namely, meaning in caregiving, caregiving mastery, positive emotion on caregiving and support from others. This classification agreed with the following factors extracted from the pilot study. The DCPFS-21 showed good internal consistency (Cronbach's $\alpha = 0.92$). In Phase 2, the DCPFS-21 correlated with the Caregiving Gratification Scale by 0.54 ($P < 0.01$). The DCPFS-21 also showed good intra-rater reliability (1.1: $\rho = 0.62$).

Conclusion: We developed and validated the DCPFS-21, which measures the positive feelings of family caregivers of people with dementia, in Japan.

INTRODUCTION

The number of elderly people with dementia worldwide is rapidly increasing.^{1,2} To address this issue, the Government of Japan formulated an updated national dementia plan (2019), which recommends that people with dementia should live in familiar environments as much as possible.³ Family caregivers of people with dementia are one of the most important resources for dementia care, considering that many people with dementia are cared for at home. However, family caregivers of people with dementia tend to be more stressed than those of physically impaired elderly,⁴ and they are at a higher risk for physical health problems.⁵ Therefore, family caregivers, as well

as the people with dementia, must receive adequate support, and psychotherapy is essential to promote emotional health.⁶ To provide proper support, healthcare providers should first appropriately assess the condition of family caregivers. Although conventional assessment of caregivers focuses on care burden,⁷ several recent studies have shed light on the importance of caregiving satisfaction,⁸ meaning,⁹ self-growth¹⁰ and mastery,¹¹ and the Caregiving Gratification Scale (CGS) in assessing the caregivers of people with dementia.^{12,13} Acknowledging the positive feelings of family caregivers is important to reduce the burden of care and continuing their care.^{14–16} Therefore, an appropriate scale to measure the positive

feelings resulting from caregiving is essential. The CGS is a scale for general caregiving. To the best of our knowledge, no scales have been developed in Japan to assess the positive feelings related to dementia care (e.g., caregiving satisfaction, caregiving gratification, and meaning). Furthermore, the positive feelings of dementia caregivers are different from those of caregivers overall, as the former is less likely to receive gratitude due to the unique symptoms of dementia such as a lack of insight and behavioural and psychological symptoms (BPSD). Hence, we developed the Dementia Caregiver Positive Feeling Scale (DCPFS) 25-item version (preliminary scale) to capture the positive feelings specific to dementia caregiving.¹⁷

However, the study for developing this 25-item version had several limitations. All participants belonged to the Alzheimer's Association of Japan, and the study included former caregivers. Although the sample size included in the analysis met criteria (e.g., 100 is considered excellent) as a rule of thumb,¹⁸ less than 100 participants were recruited.¹⁷

Therefore, the current study aimed to develop the DCPFS based on the preliminary scale¹⁷ by examining the construct validity and internal consistency, criterion-related validity based on the external indexes, and intra-rater reliability, with the data from more than 100 participants.

METHODS

Phase 1: Item reduction construct validation study

Participants

We asked care managers to distribute 559 sets of questionnaires to family caregivers of people with dementia in Gunma and Saitama Prefectures (12 municipalities in total). However, it is unknown if all the questionnaires were distributed to family caregivers.

Measurements

Participants completed the following four questionnaires: (i) basic information about the family caregiver; (ii) basic information about the people with dementia; (iii) Activities of Daily Living Inventory for Cognitive Impairment (ADL-cog)¹⁹ as an evaluation of cognitive impairment; and (iv) the DCPFS-27.

ADL-cog

The ADL-cog evaluated the severity of dementia. Participants rated each item on a five-point scale ranging from 0 to 4, or not gradable (N).¹⁹ The higher the score, the more severe the dementia. The ADL-cog significantly and positively correlated with the Functional Assessment Staging scores ($r = 0.72$). The intra-class correlation coefficient (ICC) of ADL-cog was 0.93.

DCPFS-27

We developed the preliminary version of the DCPFS with 27 items (DCPFS-27) based on the preliminary scale.¹⁷ Each DCPFS-27 item was scored on a four-point Likert scale ranging from 1 = strongly disagree to 4 = strongly agree. The higher the score, the better the positive feelings.

The development process of the DCPFS-27 was as follows: first, the research project, which focused on the 'Development of comprehensive BPSD prevention/treatment guideline associated with newly developed BPSD-related scales and positive care for supporting smile life', defined the positive feelings of caregivers of people with dementia as the 'situation of experiencing positive feelings by caring for people with dementia'. Next, we discussed and changed the items as follows: (i) the item 'I have a responsibility for providing care' was rejected because its meaning could be interpreted as both positive and negative; (ii) two items were added, 'I can accept everything as it is, even if I fail' and 'I have come to think that the care-recipient feels relieved to see me by his/her side'; (iii) the item 'I have come to praise the care-recipient for accomplishing activities of daily living smoothly (e.g., changing clothes and eating)' was changed to 'I have come to praise the care-recipient' because praising was more important; and (iv) the phrase 'through the care' was removed from all items to avoid redundancy. Finally, the DCPFS-27 was approved by the research group.

Statistical analysis

Statistical data were analysed using SPSS Statistics (IBM, Armonk, NY, USA).

Item analysis

Items were analysed using the whole data to examine the percentage of missing values and the item

distribution. Items with >15% of values missing were not retained, and for items in which significant floor or ceiling effects were observed, researchers considered whether those items needed to be retained. Moreover, we calculated the correlation between items and eliminated items with high correlation levels ($\rho > 0.7$). While developing this scale and selecting the items, we emphasised that caregivers could realise more positive aspects of dementia care through the use of the scale.

Validity (construct validity and factor analysis)

The factor structure was determined by factor analysis with oblique Promax rotation. We retained the factors with an eigenvalue > 1. The threshold level for factor loading was 0.4.

Reliability (internal consistency)

We evaluated the internal consistency through Cronbach's α and accepted the items that obtained a score of 0.7 or higher.

Phase 2: collateral validation study

We conducted Phase 2 to examine the criterion-related validity and internal consistency of the DCPFS-21 derived from Phase 1.

Participants

We examined the validation and intra-rater reliability of the DCPFS-21, and the care managers recruited family caregivers of people with dementia by snow-ball sampling. As Phase 2 included a large number of items, we asked care managers to introduce family caregivers who were considered physically and mentally stable enough to complete the questionnaire.

Measures

Participants completed the following five questionnaires: (i) basic information about family caregivers; (ii) basic information about the people with dementia; (iii) CGS;¹² (iv) short version of the Japanese version of the Zarit Caregiver Burden Interview (J-ZBI_8);^{20,21} and (v) DCPFS-21. To evaluate intra-rater reliability, we asked the individuals in the retest group to complete the questionnaire again 4 weeks after the first completion.

CGS

The CGS generally evaluated family caregivers' positive appraisal of their own caregiving. It consisted of eight items, each rated on a four-point Likert scale, with total scores ranging from 0 to 24.¹² Higher scores indicate more positive appraisal. The items were organised into two subscales, namely, 'sense of achievement' and 'sense of unity'. The CGS could be clinically used to evaluate the positive appraisal of the caregivers of people with dementia.¹³

J-ZBI_8

The J-ZBI_8 evaluated the care burden of family caregivers. It consisted of eight items, each rated on a five-point Likert scale, with total scores ranging from 0 to 32. Higher scores indicated more care burden.^{20,21} The items were organised into two subscales, namely, 'role strain' and 'personal strain'.

Statistical analysis

Statistical data were analysed using SPSS Statistics (IBM, Armonk, NY, USA).

Validity (criterion-related validity)

The validity was analysed by Spearman's correlation coefficients.

Reliability (intra-rater reliability)

The intra-rater reliability was analysed by an ICC of 1.1 in the eligible family caregivers whose care-recipient showed no change in medication and mental condition within 4 weeks.

Ethics statement

The ethics committees of the Tokyo Centre for Dementia Care Research and Practices, and Gunma University Graduate School of Health Science approved the study protocol, and an informed consent was obtained from each participant.

RESULTS

Phase 1: item reduction construct validation study

Participants

A total of 147 participants returned the questionnaires via mail (collection rate, 26.3%; 147/559). However, we cannot confirm the number of

questionnaires distributed to the participants, although we asked the care managers to distribute 559 questionnaires. Tables 1 and 2 summarise the demographics of the 147 participants (family caregivers and people with dementia, respectively).

Item analysis

- 1 Ceiling/floor effect (Table 3): Table 3 lists the descriptive statistics of each item. Although the item 'I feel relieved to see the care-recipient calming down' demonstrated ceiling effects (all the participants answered either 'strongly agree' or 'agree a little'), we retained it because it was considered to be highly important from the review.¹⁷ None of the items had more than 15% missing data.
- 2 Correlation with other items: although the pair of 'I have come to think that there are meanings behind the care-recipient's incomprehensible behaviour' and 'I feel glad that I am taking care of the care-recipient' indicated a significantly positive correlation ($\rho = 0.70$), we decided to delete them because they had no similarity.

Validity (construct validity and factor analysis)

The first factor analysis with 27 items was conducted on 138 family caregivers with no missing data (nine family caregivers with missing data were excluded), and six factors were extracted. Bartlett's test of sphericity was significant at more than 0.01, and the Kaiser–Meyer–Olkin value was 0.88, confirming that the data were suitable for factor analysis. On the second factor analysis, a four-factor structure from the scree plot was assumed, and the Bartlett's test of sphericity and the Kaiser–Meyer–Olkin value were the same as those on the first factor analysis. The second factor analysis revealed that five items showed factor loadings of less than 0.4 (See Table S1). These five items were as follows: 'I was able to think about my life in old age', 'My family relationship has deepened', 'I have come to think that there are meanings behind the care-recipient's incomprehensible behaviour', 'I have come to think that the care-recipient feels relieved to see me by his/her side' and 'I can accept everything as it is, even if I fail'. These five items were then excluded. Meanwhile, the item 'I have come to reach out to people in need' showed a low factor loading of 0.48, thereby it was also

excluded by two researchers. Overall, six items were excluded, leaving 21 items. On the third factor analysis, all 21 items showed sufficient factor loadings. Table 4 lists the items and their factor loadings. The item 'I have come to deal with the care-recipient's various behaviours (e.g., memory lapses, wandering) properly' was included in factor 2 (factor loading = 0.33) from the review.¹⁷ Finally, the DCPFS-21 was developed.

Reliability (internal consistency)

Through the abovementioned analysis, we reduced the 27 items to 21 items. The four factors of the DCPFS-21 were labelled and evaluated as potential subscales as follows: meaning in caregiving (eight items; Cronbach's $\alpha = 0.88$); caregiving mastery (five items; Cronbach's $\alpha = 0.85$); positive emotion on caregiving (three items; Cronbach's $\alpha = 0.76$); and support from others (five items; Cronbach's $\alpha = 0.74$). The Cronbach's α of the whole 21 items was 0.92. By eliminating the item 'I feel relieved to see the care-recipient calming down' in the category 'Positive emotion on caregiving,' Cronbach's α was increased by 0.04; however, the item was retained because as mentioned above, it was considered to be an important factor in the positive feelings of the caregivers of people with dementia and the Cronbach's α for the category itself was sufficient.

RESULTS 2

Phase 2: collateral validation study

Participants

In the Phase 2 study, we enrolled 30 participants. For caregivers, the mean age was 62.6 ± 11.9 years, with 22 females and a mean care experience of 6.7 ± 5.6 years. As for mean total scores, the DCPFS-21 was 67.1 ± 5.5 , the CGS was 13.8 ± 4.1 and the J-ZBI_8 was 13.1 ± 6.6 . For people with dementia, the mean age was 82.5 ± 10.0 years, with 24 females; the dementia status was categorised into dementia secondary to Alzheimer's disease (16), unknown (six), others (eight). Among these people with dementia, eight, 10, seven and three required care levels one, two, three and five, respectively, and approval was pending for two.

After 4 weeks, 14 consented participants were re-evaluated. Finally, the data from 10 family caregivers whose care-recipients showed no change of

Table 1 Basic characteristics of the family caregivers in Phase 1 of the study

Characteristic		<i>n</i> (%)
Age (years)	Mean \pm SD	64.81 \pm 11.97
Gender	Female	113 (76.9)
	Male	34 (23.1)
Experience of care (years)	Mean \pm SD	6.53 \pm 7.67
Number of people living at home	2 (people with dementia and caregiver)	47 (32.0)
	3	56 (38.1)
	≥ 4	41 (27.9)
	Unknown	3 (2.0)
Employment	Yes	75 (51.0)
	No	71 (48.3)
	Unknown	1 (0.7)
Care-recipient	Husband	34 (23.1)
	Wife	14 (9.5)
	Birth father	11 (7.5)
	Birth mother	60 (40.8)
	Father-in-law	4 (2.7)
	Mother-in-law	20 (13.6)
	Others	4 (2.8)
Time allocated for care in a day	Almost all the time	57 (38.8)
	Half a day	21 (14.3)
	2–3 h	21 (14.3)
	At the time of need	36 (24.5)
	Others	12 (8.2)
Health condition	Healthy	104 (70.7)
	Not healthy	43 (29.3)
Services used (multiple answer)	Home visit	26 (17.7)
	Communiting	118 (80.3)
	Short-term institutionalisation	56 (38.1)
	Small-sized multifunctional at-home care	4 (2.7)
	Informal support	10 (6.8)
	Nothing	8 (5.4)

medication and mental condition during the 4 weeks of the study were used to analyse the intra-rater reliability.

Validity (criterion-related validity)

Table 5 shows the Spearman's correlation coefficients between the DCPFS-21 (total and subscale), the CGS and the J-ZBI_8.

The DCPFS-21 total scores showed significant and positive correlations with the CGS total scores ($\rho = 0.54$, $P = 0.002$) and with the scores of the CGS subscale 'sense of unity' ($\rho = 0.57$, $P = 0.001$). Conversely, the J-ZBI_8 total and subscale scores did not demonstrate significance.

The scores for 'meaning in caregiving' correlated with the CGS total scores ($\rho = 0.39$, $P = 0.03$) and

Table 2 Basic characteristics of the people with dementia (care-recipients) in Phase 1 of the study

Characteristic		<i>n</i> (%)
Age	Mean \pm SD	85.90 \pm 6.65
Gender	Female	92 (62.6)
	Male	55 (37.4)
Diagnosis	Dementia secondary to Alzheimer's disease	74 (50.3)
	Dementia secondary to cerebrovascular disease	10 (6.8)
	Dementia secondary to Lewy body disease	7 (4.8)
	Frontotemporal dementia	2 (1.4)
	Mixed dementia	5 (3.5)
	Unknown	43 (29.3)
	Other	6 (4.1)
Care level [†]	Pending approval	4 (2.7)
	Support level 1	5 (3.4)
	Support level 2	5 (3.4)
	Care level 1	32 (21.8)
	Care level 2	45 (30.6)
	Care level 3	31 (21.1)
	Care level 4	15 (10.2)
	Care level 5	10 (6.8)
ADL-cog	Independence	1 (0.7)
	IADL-assistance	18 (12.2)
	BADL-light assistance	23 (15.6)
	BADL-middle assistance	49 (33.3)
	BADL-all assistance	52 (35.4)
	Bedridden	2 (1.4)
	Unknown	2 (1.4)

ADL-cog, Activities of Daily Living Inventory for Cognitive Impairment; IADL, Instrumental Activities of Daily Living; BADL, Basic Activities of Daily Living.

[†]The classification to separate the conditions of people who require long-term care services into seven levels: support required (1–2) and care level (1–5).

the scores of the CGS subscale 'sense of unity' ($\rho = 0.54$, $P = 0.002$). The 'positive emotion on caregiving' scores also correlated with the 'sense of unity' scores ($\rho = 0.40$, $P = 0.03$). The 'support from others' scores correlated with the total scores of J-ZBI_8 ($\rho = 0.41$, $P = 0.02$) and with the J-ZBI_8 subscales for role strain ($\rho = 0.36$, $P = 0.048$) and personal strain ($\rho = 0.41$, $P = 0.03$).

Reliability (intra-rater reliability)

The DCPFS-21 scores showed good intra-rater reliability (ICC 1.1 = 0.62) as did the following four potential subscales: meaning in caregiving (ICC 1.1 = 0.39), caregiving mastery (ICC 1.1 = 0.46), support from others (ICC 1.1 = 0.63) and positive emotion on caregiving (ICC 1.1 = 0.79).

Table 3 Responses for the Dementia Caregiver Positive Feeling Scale 27-item version in Phase 1 of the study

Item	Strongly agree	Agree a little	Disagree a little	Strongly disagree	Mean \pm SD	n (%) Missing data
I feel relieved to see the care-recipient calming down.	109 (74.1)	38 (25.9)	0	0	3.7 \pm 0.4	0
I feel glad to see the care-recipient's smile.	84 (57.1)	51 (34.7)	9 (6.1)	3 (2.0)	3.5 \pm 0.7	0
I feel glad to see the care-recipient accomplishing activities of daily living smoothly (e.g., changing clothes, eating).	82 (55.8)	52 (35.4)	10 (6.8)	3 (2.0)	3.5 \pm 0.7	0
I was able to think about my life in old age.	77 (52.7)	51 (34.7)	16 (10.9)	3 (2.0)	3.4 \pm 0.8	0
I have got room to breathe by using the long-term care service.	73 (50.3)	56 (38.6)	10 (6.9)	6 (4.1)	3.3 \pm 0.9	2
I was able to meet reliable medical/welfare professionals.	60 (41.1)	71 (48.6)	12 (8.2)	3 (2.1)	3.3 \pm 0.8	1
I feel better after talking with a person in the same situation as myself.	65 (44.2)	56 (38.1)	23 (15.6)	3 (2.0)	3.2 \pm 0.8	0
I have come to think that the care-recipient feels relieved to see me by his/her side.	62 (42.2)	57 (38.8)	22 (15.0)	6 (4.1)	3.2 \pm 0.8	0
My family moved toward a deeper understanding of dementia.	42 (28.6)	81 (55.1)	22 (15.0)	2 (1.4)	3.1 \pm 0.7	0
I have come to think that there are meanings behind the care-recipient's incomprehensible behaviour.	40 (27.4)	73 (50.0)	30 (20.5)	3 (2.1)	3.0 \pm 0.8	1
I have come to reach out to people in need.	31 (21.1)	84 (57.1)	28 (19.0)	4 (2.7)	3.0 \pm 0.7	0
I have come to deal with the care-recipient's various behaviours (e.g., memory lapses, wandering) properly.	27 (18.4)	87 (59.2)	29 (19.7)	4 (2.7)	2.9 \pm 0.7	0
I have come to study more for providing better care.	33 (22.4)	75 (51.0)	32 (21.8)	7 (4.8)	2.9 \pm 0.8	0
I feel glad that the care-recipient is here.	37 (25.2)	68 (46.3)	32 (21.8)	10 (6.8)	2.9 \pm 0.9	0
I feel glad that I am taking care of the care-recipient.	39 (26.5)	62 (42.2)	34 (23.1)	12 (8.2)	2.9 \pm 0.9	0
I can accept everything as it is, even if I fail.	22 (15.1)	88 (60.3)	32 (21.9)	4 (2.7)	2.9 \pm 0.7	1
My family relationship has deepened.	29 (19.7)	66 (44.9)	47 (32.0)	5 (3.4)	2.8 \pm 0.8	0
I have come to listen deeply to the care-recipient.	30 (20.7)	71 (49.0)	35 (24.1)	9 (6.2)	2.8 \pm 0.9	2
I think caregiving is a way to return the favour to the care-recipient.	31 (21.4)	70 (48.3)	31 (21.4)	13 (9.0)	2.8 \pm 0.9	2
I learned from the care-recipient.	32 (21.8)	64 (43.5)	36 (24.5)	15 (10.2)	2.8 \pm 0.9	0
I have come to think that there are meanings in my life.	33 (22.4)	59 (40.1)	43 (29.3)	12 (8.2)	2.8 \pm 0.9	0
My neighbours moved toward a deeper understanding of dementia.	27 (18.4)	67 (45.6)	45 (30.6)	8 (5.4)	2.8 \pm 0.8	0
When the care-recipient repeatedly asks the same questions, I have come to answer them each time as if for the first time.	32 (22.1)	61 (42.1)	41 (28.3)	11 (7.6)	2.8 \pm 0.9	2
I have obtained perseverance.	28 (19.1)	64 (43.5)	45 (30.6)	9 (6.1)	2.7 \pm 0.9	1
I have come to praise the care-recipient.	26 (17.7)	58 (39.5)	56 (38.1)	7 (4.8)	2.7 \pm 0.8	0
I discovered a new side of the care-recipient.	16 (10.9)	55 (37.4)	61 (41.5)	15 (10.2)	2.5 \pm 0.8	0
My relationship with the care-recipient has deepened.	20 (13.6)	48 (32.7)	60 (40.8)	19 (12.9)	2.5 \pm 0.9	0

Missing data were rejected from the answer rates of the preliminary 27-item scale.

DISCUSSION

Validity

We developed the DCPFS-21 from the preliminary version DCPFS-25. The DCPFS-21 was divided into four subscales, namely, meaning in caregiving, caregiving mastery, positive emotion on caregiving and support from others. This division agreed with the following factors extracted from the pilot study: caregiving mastery, support from others, positive emotion on caregiving, family relationship and meaning in caregiving; however, the family relationship factor was included in the 'support from others' of the

DCPFS-21.¹⁷ Moreover, the four subscales and 21 items of the DCPFS-21 were similar to the following 10 themes related to the positive gains identified in the study of 669 diary recordings over an 8-week period:²² (i) learning about dementia and accepting the condition; (ii) having a sense of purpose and commitment to the caregiving role; (iii) feeling grateful when the care-recipient was functioning relatively well; (iv) mastering skills on handling the care-recipient; (v) having increased patience and tolerance; (vi) cultivating positive meanings and humour amid difficult circumstances; (vii) letting go of things, such

Table 4 Component factors of the Dementia Caregiver Positive Feeling Scale 21-item version in Phase 1 of the study ($n = 138$)

Item	Factor loadings			
	I	II	III	IV
Factor 1: Meaning in caregiving ($\alpha = 0.88$)				
I feel glad that I am taking care of the care-recipient	0.707	0.212	0.006	-0.009
My relationship with the care-recipient has deepened	0.699	0.034	-0.154	-0.067
I think caregiving is a way to return the favour to the care-recipient	0.668	-0.269	-0.159	0.189
I feel glad that the care-recipient is here	0.667	-0.026	-0.231	-0.117
I learned from the care-recipient	0.639	0.094	-0.005	0.013
I have come to think that there are meanings in my life	0.626	0.133	0.070	0.162
I have obtained perseverance	0.596	0.067	0.168	0.143
I discovered a new side of the care-recipient	0.485	0.124	-0.094	0.033
Factor 2: Caregiving mastery ($\alpha = 0.85$)				
I have come to praise the care-recipient	0.165	0.738	-0.093	-0.108
When the care-recipient repeatedly asks the same questions, I have come to answer them each time as if for the first time	-0.019	0.687	0.053	0.155
I have come to listen deeply to the care-recipient	0.111	0.658	-0.146	0.106
I have come to study more for providing better care	0.074	0.629	-0.076	0.115
I have come to deal with the care-recipient's various behaviours (e.g., memory lapses, wandering) properly	-0.053	0.301	-0.068	0.505
Factor 3: Positive emotion on caregiving ($\alpha = 0.76$)				
I feel glad to see the care-recipient's smile	0.143	0.096	-0.800	-0.053
I feel glad to see the care-recipient accomplishing activities of daily living smoothly (e.g., changing clothes, eating)	0.025	0.038	-0.725	0.073
I feel relieved to see the care-recipient calming down	0.035	0.031	-0.453	0.188
Factor 4: Support from others ($\alpha = 0.74$)				
My family moved toward a deeper understanding of dementia	0.096	0.044	0.014	0.622
I feel better after talking with a person in the same situation as myself	-0.012	0.027	-0.144	0.605
I have got room to breathe by using the long-term care service	0.300	-0.120	0.091	0.559
My neighbours moved toward a deeper understanding of dementia	-0.054	0.042	-0.117	0.516
I was able to meet a reliable medical/welfare professional	0.082	0.149	0.033	0.433

Factor analysis was conducted with the oblique Promax rotation. Bartlett's test of sphericity was significant at <0.01 , and the Kaiser-Meyer-Olkin value was 0.88. The 21-item version obtained a Cronbach's α value of 0.92.

Table 5 Criterion-related validity of the Dementia Caregiver Positive Feeling Scale 21-item (DCPFS-21) version in Phase 2 of the study ($n = 30$)

Spearman's ρ						
	CGS	Sense of achievement (CGS)	Sense of unity (CGS)	J-ZBI_8	Role strain (J-ZBI_8)	Personal strain (J-ZBI_8)
DCPFS-21	0.54**	0.34 ($P = 0.07$)	0.57**	0.32	0.31	0.26
Meaning in caregiving	0.39*	0.18	0.54**	0.08	0.02	0.07
Caregiving mastery	0.26	0.07	0.33	0.23	0.31	0.13
Positive emotion on caregiving	0.26	0.04	0.40*	0.08	0.10	0.05
Support from others	0.28	0.32	0.11	0.41*	0.36*	0.41*

* $P < 0.05$ indicates significance. ** $P < 0.01$ indicates significance. CGS, Caregiving Gratification Scale, J-ZBI_8: Japanese version of the Zarit Care Burden Interview.

as when the care-recipient's qualities had been lost or personal agenda had become unrealistic; (viii) developing a closer relationship with the care-recipient;

(ix) finding support; and (x) feeling useful when helping other caregivers.²² Our results resembled the domains in previous studies describing the positive aspects of

caring for people with dementia.²³ The previous studies also agreed with our analysis of the positive diaries in which the family caregivers of people with dementia described three good things with reasons and self-praising statements.²⁴ The DCPFS-21 scores correlated with the CGS and its subscales, indicating the usefulness of this scale to these family caregivers.¹³ Therefore, the DCPFS-21, which consisted of four subscales, was sufficiently valid. Meanwhile, DCPFS-21 had no significant correlation with J-ZBI_8. Previous literature on well-being and attitude argued that positive and negative aspects were not necessarily polar opposites and could be independent from each other^{25,26} or even coexist.^{27,28} In a Chinese study, the positive aspects of the caregiving scale were not significantly related to caregiver burden, and caregivers could experience high levels of positive appraisal despite having feelings of burden.²⁸ Therefore, a positive feeling was an independent factor from burden,^{8,25,26} consistent with the current result.

The positive aspects of caregiving were related to the caregiver's relationship to the care-recipient.^{29–32} For example, wives of the eldest sons (caregivers of mothers-in-law) tended to think negative thoughts about caregiving²⁹ and be less open-minded about caregiving.³¹ However, we could not analyse the relationship between family caregivers and people with dementia, because this study mainly aimed to develop a new scale and the number of subjects was excessively small. Hence, the correlation of DCPFS-21 with these other factors should be investigated in the future.

Reliability

The DCPFS-21 showed good intra-rater reliability,³³ and the Cronbach's α coefficient for the 21 items and the subscales ranged from 0.74 to 0.92, suggesting sufficient reliability.

Limitations

Meanwhile, this study has several limitations. Our results cannot be generalised, because we conducted this research only in limited regions of Japan and purposive sampling was used for selecting participants. Thus, more representative samples are required for further study. However, considering the difficulties associated with directly distributing questionnaires to the caregivers of people with dementia, the response rate was low,³⁴ and this problem remains to be solved.

Conclusion

The DCPFS-21 is valid and reliable and is beneficial for recognising positive feelings about caregiving. Although the relevant positive aspects of caregiving scales were developed abroad,^{28,35,36} the development of DCPFS-21 highlighted the feelings of the family caregivers of people with dementia. The Japanese version of the DCPFS-21 can be accessed at the DCnet (<https://www.dcnet.gr.jp/support/bpsd/>) as well as at another website (<https://www.bpsd-web.com/index.html>). By measuring positive feelings using the DCPFS-21 as well as by evaluating care burden, the feelings of family caregivers of people with dementia can be assessed comprehensively. We hope that our research results will be widely recognised by professionals as well as add value to the general public.

ACKNOWLEDGMENTS

The authors thank all the study participants and the study supporters. Special thanks also go to Hiroki Kawashima for the advice on translation from Japanese to English. The authors would like to thank Enago (www.enago.jp) for the English language review. This research was supported by AMED under Grant Number JP19dk0207033 and JSPS KAKENHI Grant Number JP18K12990.

DISCLOSURE STATEMENT

The authors have no potential conflicts of interest to disclose.

REFERENCES

- 1 Prince M, Wimo A, Guerchet M, Ali G, Wu Y, Prina M. *The global impact of dementia: an analysis of prevalence, incidence, cost and trends. World Alzheimer Report 2015*. [cited 13 June 2020]. Available from URL: <https://www.alz.co.uk/research/WorldAlzheimerReport2015.pdf>.
- 2 Ninomiya T. Research on future projection of the population of the elderly with dementia in Japan 2015. Ministry of health, labour and welfare 2015. [cited 13 June 2020]. Available from URL: <https://mhlw-grants.niph.go.jp/niph/search/NIDD00.do?resrchNum=201405037A> (in Japanese).
- 3 Ministry of Health Labour and Welfare of Japan. Japanese dementia strategy Ministry of Health Labour and Welfare of Japan. [cited 1 June 2020]. Available from URL: <https://www.mhlw.go.jp/content/000522832.pdf> (in Japanese).
- 4 Ory MG, Hoffman RR 3rd, Yee JL, Tennstedt S, Schulz R. Prevalence and impact of caregiving: a detailed comparison between dementia and nondementia caregivers. *Gerontologist* 1999; **39**: 177–185.

- 5 Pinquart M, Sörensen S. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. *Psychol Aging* 2003; **18**: 250–267.
- 6 Cheng ST, Au A, Losada A, Losada A, Thompson LW, Gallagher-Thompson D. Psychological interventions for dementia caregivers: what we have achieved, what we have learned. *Curr Psychiatry Rep* 2019; **21**: 59.
- 7 Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. *Gerontologist* 1980; **20**: 649–655.
- 8 Kramer BJ. Gain in the caregiving experience: where are we? What next? *Gerontologist* 1997; **37**: 218–232.
- 9 Farran CJ, Keane-Hagerty E, Salloway S, Kupferer S, Wilken CS. Finding meaning: an alternative paradigm for Alzheimer's disease family caregivers. *Gerontologist* 1991; **31**: 483–489.
- 10 Skaff MM, Pearlin LI. Caregiving: role engulfment and the loss of self. *Gerontologist* 1992; **32**: 656–664.
- 11 Lawton MP, Kleban MH, Moss M, Rovine M, Glicksman A. Measuring caregiving appraisal. *J Gerontol* 1989; **44**: 61–71.
- 12 Nishimura M, Suda Y, Campbell R, Izumo Y, Nihida M, Takahashi R. Development of the caregiving gratification scale. *J Health Welf Stat* 2005; **52**: 8–13. (in Japanese).
- 13 Kajiura K, Ono M. A study on positive appraisal and characteristics of caregivers of elderly with dementia. *J Jpn Soc Dementia Care* 2012; **11**: 487–495. (in Japanese with English abstract).
- 14 Fujii T, Yamagami T, Yamaguchi H. The effects of positive diary intervention for family caregivers of people with dementia. *J Jpn Soc Dementia Care* 2018; **16**: 779–790. (in Japanese with English abstract).
- 15 Yamaguchi H. Dementia-positive: direction of the Tokyo Center for Dementia Care Research and Practices. *Tokyo J Dementia Care Res* 2017; **1**: 11–19. (in Japanese).
- 16 Kaziwara K, Nakatani H, Ono M, Miyakoshi Y. Positive appraisal of in-home family caregivers of dementia patients as an influence on the continuation of caregiving. *Psychogeriatrics* 2015; **15**: 26–31.
- 17 Fujii T, Tabei Y, Simamura M, Yamagami T. Factors influencing a sense of positivity towards caregiving designed exclusively for people who provide such care for elderly family members with dementia: a preliminary study to develop a scale for the assessment of a sense of positivity towards caregiving for the elderly with dementia. *J Health Welf* 2015; **12**: 1–14. (in Japanese with English abstract).
- 18 Terwee CB, Mokkink LB, Knol DL, Ostro RW, Bouter LM, de Vet HC. Rating the methodological quality in systematic reviews of studies on measurement properties; a scoring system for the COSMIN checklist. *Qual Life Res* 2012; **21**: 651–657.
- 19 Imai Y, Osada H, Homma A *et al.* Two new assessment scales for ADL and behavioral and psychological symptoms of persons of suffering from cognitive impairment. *Jpn J Geriatr Psychiatry* 2011; **22**: 1155–1165. (in Japanese with English abstract).
- 20 Arai Y, Tamiya N, Yano E. The short version of the Japanese version of the Zarit caregiver Burden interview (J-ZBI_8): its reliability and validity. *Jpn J Geriatr* 2003; **40**: 497–503. (in Japanese with English abstract).
- 21 Arai Y. *The Japanese Version of the Zarit Caregiver Burden Interview and its Short Version (the J-ZBI and J-ZBI_8)*. Kyoto: Sankyo Publishers, 2018; (in Japanese).
- 22 Cheng ST, Mak EP, Lau RW, Ng NS, Lam LC. Voices of Alzheimer caregivers on positive aspects of caregiving. *Gerontologist* 2015; **56**: 451–460.
- 23 Yu DSF, Cheng S-T, Wang J. Unravelling positive aspects of caregiving in dementia: an integrative review of research literature. *Int J Nurs Stud* 2018; **79**: 1–26.
- 24 Fujii T, Yamagami T, Yamaguchi H. The content of "positive diary" described by family caregivers of people with dementia for promoting positive notification. *J Jpn Soc Dementia Care* 2019; **17**: 735–741. (in Japanese).
- 25 Bradburn NM. *The Structure of Psychological Well-Being*. Chicago, IL: Chicago Aldine, 1969.
- 26 Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol* 1988; **54**: 1063–1070.
- 27 Bagozzi RP, Wong N, Yi Y. The role of culture and gender in the relationship between positive and negative affect. *Cogn Emot* 1999; **13**: 641–672.
- 28 Lou VW, Lau BH, Cheung KS. Positive aspects of caregiving (PAC): scale validation among Chinese dementia caregivers (CG). *Arch Gerontol Geriatr* 2015; **60**: 299–306.
- 29 Yamamoto N, Ishigaki K, Kuniyoshi M *et al.* Impact of the positive appraisal of care on quality of life, purpose in life, and will to continue care among Japanese family caregivers of older adults; analysis by kinship type. *Jpn J Public Health* 2002; **49**: 660–671. (in Japanese with English abstract).
- 30 Ozawa Y. Evaluation of care by caregiver for elderly with dementia; analysis by kinship. *J Jpn Soc Dementia Care* 2006; **5**: 27–34. (Japanese with English abstract).
- 31 Suzuki N, Yaguchi K, Asakawa T. A study of the concept-structure and its explanatory factors for the caring behavior performed by female caregivers. *Jpn J Gerontol* 2004; **26**: 68–77. (Japanese with English abstract).
- 32 de Labra C, Millán-Calenti JC, Buján A *et al.* Predictors of caregiving satisfaction in informal caregivers of people with dementia. *Arch Gerontol Geriatr* 2015; **60**: 380–388.
- 33 Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977; **33**: 159–174.
- 34 Furukawa H, Greiner C. Developing a social capital scale for family caregivers of people with dementia. *Geriatr Nurs* 2020; **41**: 740–746.
- 35 Abdollahpour I, Nedjat S, Noroozian M, Salimi Y, Majdzadeh R. Positive aspects of caregiving questionnaire. *J Geriatr Psychiatry Neurol* 2017; **30**: 77–83.
- 36 Tarlow BJ, Wisniewski SR, Belle SH *et al.* Positive aspects of caregiving: contributions of the REACH project to the development of new measures for Alzheimer's caregiving. *Res Aging* 2004; **26**: 429–453.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's website: <http://onlinelibrary.wiley.com/doi/supinfo>.

Table S1 The result of second factor analysis of the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Phase 1 of the study ($n = 138$)